

 **SCAN ME**

CHECK YOUR ANSWERS

- (b) For the test in part (a)
- (i) write down the p -value **(1)**
 - (ii) find the critical region **(2)**
 - (iii) find the actual level of significance **(1)**

This image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a small, partially visible blue circular logo or watermark.

1





- (d) Find the acceptance region for the test in part (b) (2)

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3

- (d) Find the actual find the actual level of significance for the test. (1)

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4

5 Data from a school shows that each week, 8% of the students receive a detention.

One week, the headteacher selects a sample of 25 students.

- (i) no students receive a detention **(1)**
- (ii) less than 3 students receive a detention. **(1)**

The headteacher believes that with a new behaviour policy the proportion of students receiving a detention in a week will decrease.

After the introduction of the new policy, a new sample of 50 students is taken and the headteacher finds that 1 student received a detention.

- (c) Carry out a suitable test to determine whether the proportion of students receiving a detention has decreased. You should state your hypothesis clearly and use a 10% level of significance. **(4)**

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(Total for Question 5 is 7 marks)

6

Thomas carries believes that the true proportion of trains that are on time is lower than 95%

He decides to take a random sample of 20 trains to see if they are on time or not.

- (a) Suggest a suitable distribution to model the number of trains from the sample that are on time. **(1)**

- (b) State an assumption that you have made when modelling the distribution in part (a) (1)

Using his sample, Thomas carries out a hypothesis test, at a 1% level of significance, to test the train operator's claim.

- (c) State suitable hypotheses that Thomas could use. (1)

- (d) For the hypothesis test, find

- (i) the critical region (2)

- (ii) the acceptance region
- (1)

- (iii) the actual significance level (1)

Thomas observes that 17 of the trains from the sample are on time.

- (e) State the conclusion of the hypothesis test. (1)

[illegible]

(Total for Question 6 is 8 marks)



8

A random sample of 1000 people from the UK is taken and they are asked if they are left-handed.

- (ii) at least 110 are left-handed (2)

Jeremy wants to test if the proportion of people in his city that are left-handed is different to that of the UK.

Jeremy randomly samples 90 people and finds that 4 of them are left-handed.

- You should state your hypothesis clearly and use a 5% level of significance. (4)

[illegible]

(Total for Question 8 is 8 marks)



10 A skincare company claims that 4 in 5 users of their product reported “visibly better skin”.

An advertising standards organisation decided to conduct a hypothesis test, at the 1% level of significance, to investigate if the true proportion differed from 4 in 5 users.

A random sample of 45 users of the product was taken and they were asked if they had “visibly better skin”.

- (a) State suitable hypotheses that the advertising standards organisation could use for this test. **(1)**

- (b) Find the critical region for this test.

You should state the probability associated with each tail, which should be as close to 0.5% as possible.

- (c) Find the actual find the actual level of significance for the test. **(1)**

The advertising standards organisation observed that 27 of the 45 users of the product reported “visibly better skin”.

- (d) State the conclusion of the hypothesis test. (1)

[illegible]

(Total for Question 10 is 7 marks)

